

Claims

- [c1] 1. A system for handling airflow in a paint booth, comprising:
- a paint booth adapted to receive airflow from two or more plenum outlets located above the paint booth;
 - a primary plenum supplied with higher pressure air by an air source and having a primary plenum outlet;
 - a secondary plenum, within the primary plenum and supplied with air by the primary plenum, with said secondary plenum having a secondary plenum outlet adjacent to a portion of said primary plenum outlet and generally above a paint spray applicator within said paint booth;
 - an airflow detector, within the paint booth near said paint spray applicator, adapted to transmit a signal corresponding to air velocity below the secondary plenum outlet; and
 - an adjustable damper adapted to control airflow from the primary plenum to the secondary plenum based at least in part on the value of said air velocity signal.
- [c2] 2. An airflow handling system according to Claim 1, further comprising variable density filter media across both

of said plenum outlets, with said variable density filter media creating differential air velocity flows at various locations in said paint booth.

[c3] 3. An airflow handling system according to Claim 2, wherein the filter media at the secondary plenum outlet is less dense than the average filter media density at the primary plenum outlet.

[c4] 4. An airflow handling system according to Claim 3, wherein the filter media at the primary plenum outlet is comprised of a combination of higher density filter media and lower density filter media.

[c5] 5. An airflow handling system according to Claim 4, wherein said filter media has a relatively higher density at a plurality of locations at the primary plenum outlet, thereby creating low velocity airflow beneath said locations within the paint booth.

[c6] 6. An airflow handling system according to Claim 5, wherein said filter media has a relatively lower density at a plurality of locations at the primary plenum outlet thereby creating high velocity airflow beneath said locations within the paint booth.

[c7] 7. An airflow handling system according to Claim 1, wherein said paint spray applicator is adapted to paint

generally horizontal surfaces.

- [c8] 8. An airflow handling system according to Claim 1, wherein the secondary plenum is adapted to minimize the airflow impinging directly on said paint spray applicator.
- [c9] 9. An airflow handling system according to Claim 8 wherein an airflow restrictor is located at the secondary plenum outlet directly above said paint spray applicator.
- [c10] 10. An airflow handling system according to Claim 8, wherein the secondary plenum outlet is divided into a forward secondary plenum outlet section located forward of said paint spray applicator and an aft secondary plenum outlet section located aft of said paint spray applicator.
- [c11] 11. A system for handling airflow in a paint booth comprising:
 - a paint booth adapted to receive airflow from two or more plenum outlets located above the paint booth;
 - a primary plenum supplied with higher pressure air from an air source and having a primary plenum outlet;
 - a secondary plenum within the primary plenum, supplied with air by the primary plenum and having a secondary plenum outlet adjacent to a portion of said primary

plenum outlet and generally above a paint spray applicator within said paint booth, wherein relatively low density filter media extends between the secondary plenum outlet and the balance of the paint booth, and wherein the secondary plenum outlet has one or more airflow restrictors directly above the paint spray applicator;

a variable density filter media extending across the primary plenum outlet, with relatively higher density media being installed at a plurality of locations at the primary plenum outlet, thereby creating lower velocity airflow beneath said locations within the paint booth, and with relatively lower density media being installed at a plurality of locations at the primary plenum outlet, thereby creating high velocity airflow beneath said locations;

an airflow velocity detector within the paint booth and near said paint spray applicator, adapted to transmit a signal corresponding to air velocity below the secondary plenum outlet; and

an adjustable damper for controlling airflow from the primary plenum to the secondary plenum based at least in part on the value of said air velocity signal.

- [c12] 12. A method of controlling airflow velocity in a paint booth comprising:
- supplying air under pressure to a primary plenum having a primary plenum outlet located above a paint booth;

supplying air from the primary plenum to a secondary plenum that is located within the primary plenum, with said secondary plenum having a secondary plenum outlet located generally above a paint spray applicator within said paint booth;

using an airflow velocity detector to generate a signal corresponding to air velocity beneath the secondary plenum outlet; and

controlling the air supplied to the secondary plenum in real time by adjusting a damper at a secondary plenum inlet based at least in part on the value of said air velocity signal.